Pilot Total Exposure Study Draft Study Report

Preliminary ETS exposure data analysis

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PM3006488802

Source: https://www.industrydocuments.ucsf.edu/docs/xyhj0001

Study objective

To assess ETS exposure for a period of the past 3 months of adult non-smokers and smokers of 3.0 to 6.9 mg FTC tar delivery cigarettes in a US population study, urinary nicotine plus 5 nicotine metabolites (representing ~90 % of the total nicotine uptake during the past few days), 4-aminobiphenyl- (ABP) hemoglobin adducts, and self-reported ETS exposure (questionnaire, diary) are selected. The results of the biomarker analyses and the self-reported ETS exposure will be compared.

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ETS exposure assessment

- Measure levels of biomarkers indicating short-term and longer-term ETS exposure
- Obtain subjective estimates of ETS exposure for the corresponding time frames using questionnaires and diaries, based on duration and intensity of exposure in various venues
- Compare ETS exposure measured by biomarkers with subjective estimates

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Biomarkers Selected

Short-term exposure (past 3 days)

- Nicotine and metabolites in 24-hr urine

	Percent nicotine uptake mean (SD)
– trans-3'-hydroxycotinine	36.1(10.6)
– trans-3'-hydroxycotinine-glucuronide	22.8(10.0)
– cotinine-glucuronide	14.0(5.4)
– cotinine	9.2(2.6)
– nicotine	9.4(5.7)
– nicotine-N-glucuronide	4.5(2.5)
Total:	96.0

Longer-term exposure (past 3 months)

- 4-aminobiphenyl (ABP)- hemoglobin adducts in blood

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Questionnaire: Key Factors of ETS Exposure

- **Time frame**
  - 3 days
  - 3 months

- **Duration**
  - hours per day
  - days per week

- **Venue**
  - home
  - work
  - transit
  - others

- **Intensity**
  - no. of cigarettes
  - subjective
    - low
    - medium
    - high

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Preliminary data analysis

- Non-smokers' ETS exposure
- Self-reported 'exposed' vs. 'not exposed'
- Statistical difference between biomarker levels of 'exposed' vs. 'not exposed'
- Exposure duration, intensity and venue not yet considered

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P-values from Wilcoxon rank-sum test :

Biomarker levels of 'exposed' vs. 'not exposed' non-smoking subjects

Biomarker / Exposure								
3 day (Wk1)								
3 day (Wk2)								
3 day (Wk3)								
3 mth (Wk1)								
3 mth (Wk6)								

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P-values from Wilcoxon rank-sum test :

Biomarker levels of 'exposed' vs. 'not exposed' non-smoking subjects

Biomarker / Exposure	4 ABP-Hb add.							
3 day (Wk1)								
3 day (Wk2)								
3 day (Wk3)								
3 mth (Wk1)	0.60							
3 mth (Wk6)	0.063							

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P-values from Wilcoxon rank-sum test :

Biomarker levels of 'exposed' vs. 'not exposed' non-smoking subjects

Biomarker / Exposure	4 ABP-Hb add.							
3 day (Wk1)	0.0032							
3 day (Wk2)								
3 day (Wk3)								
3 mth (Wk1)	0.60							
3 mth (Wk6)	0.063							

Source: https://www.industrydocuments.ucsf.edu/docs/xyhj0001

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P-values from Wilcoxon rank-sum test :

Biomarker levels of 'exposed' vs. 'not exposed' non-smoking subjects

Biomarker / Exposure	4 ABP-Hb add.	Nic. + metab.
3 day (Wk1)	0.0032	0.0043
3 day (Wk2)		<0.0001
3 day (Wk3)		0.0057
3 mth (Wk1)	0.60	
3 mth (Wk6)	0.063	

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P-values from Wilcoxon rank-sum test :

Biomarker levels of 'exposed' vs. 'not exposed' non-smoking subjects

Biomarker / Exposure	Nic. + metab.	Nic.	Cot.
3 day (Wk1)	0.0040	0.40	0.43
3 day (Wk2)	<0.0001	0.0063	0.0008
3 day (Wk3)	0.0057	0.92	0.18
3 mth (Wk1)			
3 mth (Wk6)			

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P-values from Wilcoxon rank-sum test :

Biomarker levels of 'exposed' vs. 'not exposed' non-smoking subjects

Biomarker / Exposure		Nic. + metab.	Nic.	Cot.	T3HC	T3HC-Gluc	Nic-Gluc	Cot-Gluc
3 day (Wk1)		0.0040	0.40	0.43	0.0073	0.028	0.016	0.0012
3 day (Wk2)		<0.0001	0.0063	0.0008	<0.0001	0.0061	0.0001	<0.0001
3 day (Wk3)		0.0057	0.92	0.18	0.0031	<0.0001	0.0002	<0.0001
3 mth (Wk1)								
3 mth (Wk6)								

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P-values from Wilcoxon rank-sum test :

Biomarker levels of 'exposed' vs. 'not exposed' non-smoking subjects

Biomarker / Exposure	4 ABP-Hb add.	Nic. + metab.	Nic.	Cot.	T3HC	T3HC-Gluc	Nic-Gluc	Cot-Gluc
3 day (Wk1)	0.0032	0.0040	0.40	0.43	0.0073	0.028	0.016	0.0012
3 day (Wk2)		<0.0001	0.0063	0.0008	<0.0001	0.0051	0.0001	<0.0001
3 day (Wk3)		0.0057	0.92	0.18	0.0031	<0.0001	0.0002	<0.0001
3 mth (Wk1)	0.60							
3 mth (Wk6)	0.063							

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Percentage of subjects with biomarker levels below LOQ ('exposed' / 'not exposed') :

Biomarker / Exposure	4 ABP-Hb add.	Nic. + metab.	Nic.	Cot.	T3HC	T3HC-Gluc	Nic-Gluc	Cot-Gluc
3 day (Wk1)	0/0	0/0	63/91	60/89	27/40	29/56	66/97	60/89
3 day (Wk2)		0/0	64/97	43/95	21/30	23/33	66/97	43/95
3 day (Wk3)		0/0	71/94	41/90	0/63	0/65	71/94	41/90
3 mth (Wk1)	0/0							
3 mth (Wk6)	0/0							

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Preliminary observations

- 4 ABP-Hb adduct is not a sensitive marker to distinguish ETS exposed subjects from those not exposed over past 3 months
- 4 ABP-Hb adduct can distinguish exposed subjects from non exposed subjects over past 3 days
- Nicotine plus metabolites can be used to distinguish between exposed and non exposed subjects better than either nicotine or cotinine on their own
- Other nicotine metabolites may potentially be useful as markers of ETS exposure
- Difference in biomarker levels between exposed and non exposed subjects varied from week to week

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